However, if such a spark ignition engine is operated dynamically, it is often not possible to carry out such a regulation with a view to compensating for the disturbing influence so that as a result a correction via a suitable control system takes place. In this case the control system is based on a physical model which requires knowledge of the valve characteristic of the tank vent valve. The correlation between the pulse-width modulated control signal for the tank vent valve and the corresponding valve position of the tank vent valve is therefore determined by the manufacturer in the case of the known control systems and stored in a performance graph in such a way that the control system can fall back on the stored correlation between the control signal and the associated valve position while operating in order to compensate for the disturbing influence of regenerating an activated carbon filter by means of a suitable control system.

A disadvantage of this known method is the fact that the correlation between the pulse-width modulated control signal for the tank vent valve and the resulting valve position can be subject to fluctuations in which case the fluctuations are based on manufacturing tolerances, contamination and ageing effects as well as on temperature influences. As a result, the conventional control system with a view to compensating for the disturbing influence of regenerating an activated carbon filter therefore functions unsatisfactorily.

Therefore, it is the object of the invention to create a method for controlling a tank vent valve which makes possible a better compensation for the disturbing influence of regenerating an activated carbon filter.

Taking a known method for controlling a tank vent valve as the starting point, this object of the invention is achieved according to the preamble of Claim 1 by the characterizing

Patent claims

1. Method for controlling a regeneration valve (14) of a fuel vapor retention system (12) for an internal combustion engine (1), particularly a tank vent valve for regenerating an activated carbon filter during which the regeneration valve (14) is controlled by a control signal (PW), whereby the control signal (PW) corresponds to a designated valve position (Q) of the regeneration valve (14),

characterized in that,
the correlation (17) between the control signal (PW) and the resulting valve position (Q) of the regeneration valve (14) is determined during a calibration process.

2. Operating methods according to Claim 1,
characterized by
the following steps:

- Opening the regeneration valve (14) for regenerating the fuel vapor retention system (12) by controlling with a predetermined control signal (PW)
- Extracting or drawing off fuel vapor from the fuel vapor retention system (12) in the internal combustion engine (1)
- Compensating for the change in the mixture composition by the extracted or drawn off fuel vapor by means of an engine intervention
- Determining the correlation (17) between the control signal (PW) and the resulting valve position (Q) of the regeneration valve (14) from the predetermined control signal (PW) and the engine intervention required for the compensation.

3. Operating methods according to Claim 2,
characterized in that,
the engine intervention with a view to compensating for the change in the mixture composition includes an ignition angle.

4. Operating method according to Claim 2,
characterized in that,
the engine intervention with a view to compensating for the change in the mixture composition includes changing the throttle valve position.

5. Operating method according to at least one of the previous claims,
characterized in that,
the speed of the internal combustion engine (1) is measured and regulated to a predetermined desired value by engine intervention while the fuel vapor retention system (12) is being regenerated.

6. Operating method according to at least one of the previous claims,
characterized in that,
the air ratio of the exhaust gas of the internal combustion engine (1) is measured and regulated to a predetermined desired value by engine intervention while the fuel vapor retention system (12) is being regenerated.

7. Operating method according to at least one of the previous claims,
characterized in that,
the engine intervention is determined during the calibration process and is compared to at least one predetermined limiting value in order to determine the control signal in the case of which the regeneration valve (14) opens.

8. Operating method according to at least one of the previous claims,
characterized in that,
the valve position (Q) of the regeneration valve (14) is determined from the engine intervention required for the compensation.

features of Claim 1.

The invention includes the general technical teaching that the correlation between the control signal for the tank vent valve and the resulting valve position while operating is determined within the framework of a calibration process. Thus, the regeneration valve is controlled sequentially with different values of the control signal. The speed and/or the air ratio of the internal combustion engine is regulated to predetermined desired values in the case of each value of the control signal and the engine interventions required for this are determined. The valve position of the regeneration valve is derived from the engine intervention for each value of the control valve. The individual value of the control signal and the resulting valve position are then also stored as support points of a valve characteristic. This offers the advantage that ageing and contamination effects, manufacturing tolerances as well as temperature fluctuations are taken into consideration, which leads to a more accurate determination of the correlation between the control signal and the resulting valve position. When regenerating the activated carbon filter, the disturbing influence of the fuel vapors flushed from the activated carbon filter can then be compensated for in a better way.

The calibration process according to the method of the invention is preferably carried out while the internal combustion engine is idling in which case the disturbing influence of the fuel vapors flushed from the activated carbon filter is preferably already compensated for by the existing regulations.

For example, the idling speed can be measured and regulated at a predetermined desired value by means of engine intervention. The fuel vapors flushed from the activated carbon filter when it is regenerated then first of all increase the engine torque

and the resulting speed, in which case this disturbance variable is again controlled by the engine intervention as a result of which the idling speed is stabilized.

However, it is also possible that while calibrating, the air ratio of the exhaust gas of the internal combustion engine is measured and regulated to a predetermined desired value. The fuel vapors flushed from the activated carbon filter during regeneration then first of all change the ratio of the mixture in the intake tract of the internal combustion engine thereby changing the air ratio of the exhaust gas. This changing of the air ratio by regenerating the activated carbon filter is then compensated for by a suitable engine intervention as a result of which the air ratio is stabilized.